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FERAL HOGS—BOON OR BURDEN

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ABSTRACT: Feral hogs (*Sus scrofa* L.) have long been considered a pest by most land managers because of the potential range and pasture damage that can result from their feeding habits. In recent years however, second only to deer, feral hogs have become the most sought after big game animal in California. Their great reproductive capacity coupled with the ruggedness of their preferred habitat has allowed the California State Fish and Game Department to set liberal seasons and bag limits. The freedom to work within the states liberal framework has prompted some private land managers to look at controlled harvest programs with several objectives in mind. Using paid hunting as the main means of control, thus providing additional revenue for the landowner, such programs would aim at keeping the herds within the carrying capacity of the range, so that minimal damage is done to the vegetation and soil as well as keeping interspecific competition in check. Reviewed here is a description of how such a program is carried out on the Dye Creek Preserve.

INTRODUCTION

The Dye Creek Preserve is part of a multiple land use program on the Dye Creek Ranch in Tehama County, California. This program seeks to manage and utilize all the land's resources. The Preserve's operation is concerned primarily with managing the wildlife resource in conjunction with a recreation program.

Feral hogs (*Sus scrofa* L.) have been a part of the ecology on the Dye Creek range since about 1900 (Barrett, 1971). Since then, they have gained favor in the sportsman's eye and by 1966 had become the second most sought after big game animal in California. Because of their popularity as a game animal, they were recognized as a possible boon to the Preserve's recreation program. However, the recognition of the potential range damage resulting from their feeding habits could prove them to be even a greater burden.

Information had to be gathered before any real management program could be initiated; information concerning their range and distribution, movement patterns, food habits, reproduction, mortality and survival of different age groups, population size, density and structure, habitat preferences, and most important, their effects on the habitat and interspecific relationships.

ACKNOWLEDGEMENTS

To gain the necessary academic information, Mr. William S. Keeler, owner of the Dye Creek Ranch and Preserve, consulted wildlife specialist, Wayne E. Long. Mr. Long, in turn, contacted several universities where he located a student at the University of California at Berkeley who was interested in doing his doctoral dissertation on the ecology of the feral hog. Reginald H. Barrett, working under the direction of Dr. A. Starker Leopold, Dr. James S. Patton and Dr. Marshal White, came to the Dye Creek Preserve in 1967 where he remained for two and one half years while working on his doctoral dissertation entitled "Ecology of the Feral Hog in Tehama County, California". Information resulting from his study formed the foundation of the present program. This information is listed below:

1. Feral hog concentrations should be kept to 15 animals or less per square mile so that range damage would not occur and interspecific competition would be minor.
2. Feral sows have an average of two litters per year with 5.6 young per litter and a mortality of 10 to 12.5% can be expected prior to age 6 months.
3. Five major movement patterns and territories were observed.
4. Acorn production was determined to be the single most important indices for predicting deviations from the mean when considering condition, reproduction and survival of the young, as well as determining the carrying capacity of the range any one year.

DISCUSSION

In the spring of 1970 the feral hog hunting program on the Dye Creek Preserve (which to this time had few guidelines) had run into some problems.

The population had grown from an estimated 700 animals in 1966 to 1000 plus animals in 1970 (Barrett, 1971) and to 1500 plus in 1971. The herd was well above the suggested concentration of 15 animals per square mile. Likewise, the quality of the herd had dropped greatly. Trophy boars were rarely seen; boars with tusks 2 inches or larger. On one occasion, 17 consecutive days of hunting was necessary to spot one such boar. Yet some days, well over 100 animals grazing on the green hills, during the spring, could be observed. Most of these animals were sows in poor condition not suitable for eating and very young boars, not suitable as trophies. The problems resulting from this build-up were made more evident because of the poor acorn crop in 1969. Because of the lack of acorns, large herds along the face of the foothills were remaining in the pasture areas. Some pastures looked as though they had been plowed. Hogs were getting into barns where oats could be found in the hay. Neighbors were complaining because of large movements into their pastures. In the back country, they were migrating from their preferred habitat in the bottoms of the canyons, in search of food, to the steeper slopes which support very shallow soils. This resulted in soil loss due to erosion of the rooted areas.

The population explosion was a result of several activities. With the advent of the Preserve operation, hunting pressure was restricted. The property was patrolled regularly and enforcement on trespass violators was strongly encouraged. Incidental killing by ranch employees and friends was halted. Resident populations in the pasture areas resulted because of reduced harassment of animals entering them. Development of waterfowl pond systems made available approximately 7000 more acres suitable for permanent habitation. Stock pond development in the back country allowed populations to establish themselves where none existed before. Supplemental feeding during the first two years of the hunting program (in the summer months) increased noticeably the survival rate of the young during this period. Introduction of hybrid animals (European X feral stock) which were raised in pens until they were weaned, occurred during the first three seasons. Three excellent acorn crops in 1967, 1968 and 1970, encouraged maximum litter sizes and survival. Finally, during the first few seasons, the primary objective was to get the hunting program on its feet. Little was known about the feral hog herd dynamics on the Preserve. Guides were sent out into the field to help the hunter get his animal. Little else was considered. Most of the hunters were looking for "trophy" animals; ones sporting large tusks. If large ones could not be found, then smaller males were taken for the table. Sows were generally passed by. The result was an over population of feral hogs consisting of few trophy size boars and many skinny sows.

Recognizing the problems and armed with information obtained from Barrett's study, the Dye Creek Preserve's present feral hog program was initiated. This program would aim at building a quality game herd as well as provide an economical means for keeping the populations within the carrying capacity of the range.

POPULATION CONTROL

1. Recreational hunting would continue to be the tool used for controlling the population. However, specific guidelines in the hunting program itself would be installed.
2. The proper number of sows to be left in each of the five areas (defined by the five major movement patterns) had to be determined. Determining the number of adult sows was done by using observation cards (Figure 1) carried by the guides as well as their daily reports. Over a period of time, the guides were able to recognize individuals and groups because of special characteristics: coloration, size, area, bobbed tails, etc.

Assuming the maximum carrying capacity of the range is 15 animals per square mile, and knowing the area in square miles of each range, the average survival rate of hogs to the harvestable age plus the average reproductive rate, an estimate of the number of sows left in each unit can be made.

For instance, one range consists of 13.7 square miles. Thirty adult sows, having two litters per year, should result in a survival of 175% young per sow per year to the sixth month of age. This would be 53 young, at 6 months. According to Barrett, approximately 10% of each age group is lost due to causes other than hunting after 6 months (each age group being animals from 6 months to 1 year, 1-2 years up to 5 years). Ten percent of the 53 would be lost to natural causes thus leaving approximately 48 hogs at 1 year. We assume 24 of these would be males and 24 females. The males would not be trophy animals for another two years. And by this time, figuring 10% loss each year, there would be a total of 18 males in the 3-4 year age group that would be harvestable; a total of 42 harvestable animals in the unit when considering males and females (Figure 2). The range in this unit would be supporting approximately 10.4 hogs per square mile.

BOAR OBSERVATION CARD					
DATE <u>6/7 Feb 71</u>		GUIDE <u>Jim</u>			
AREA <u>Mud Willow - 3/4 mile up Dye Creek</u>					
<u>CANYON TRAIL</u>					
TOTAL	BOAR		SOW		PIGLETS
	Adult	Young	Adult	Young	
<u>23</u>	<u>2</u>	<u>7</u>	<u>9</u>	<u>5</u>	<u>6</u>
	<u>2 - Trophy (Black)</u>		<u>1 BL</u>	<u>3 BL</u>	
			<u>1 R-BL</u>	<u>2 R-BL</u>	
			<u>1 White</u>	<u>100 lbs</u>	
			<u>100-200 lbs</u>		

Figure 1. Sample of an observation card filled out in the field.

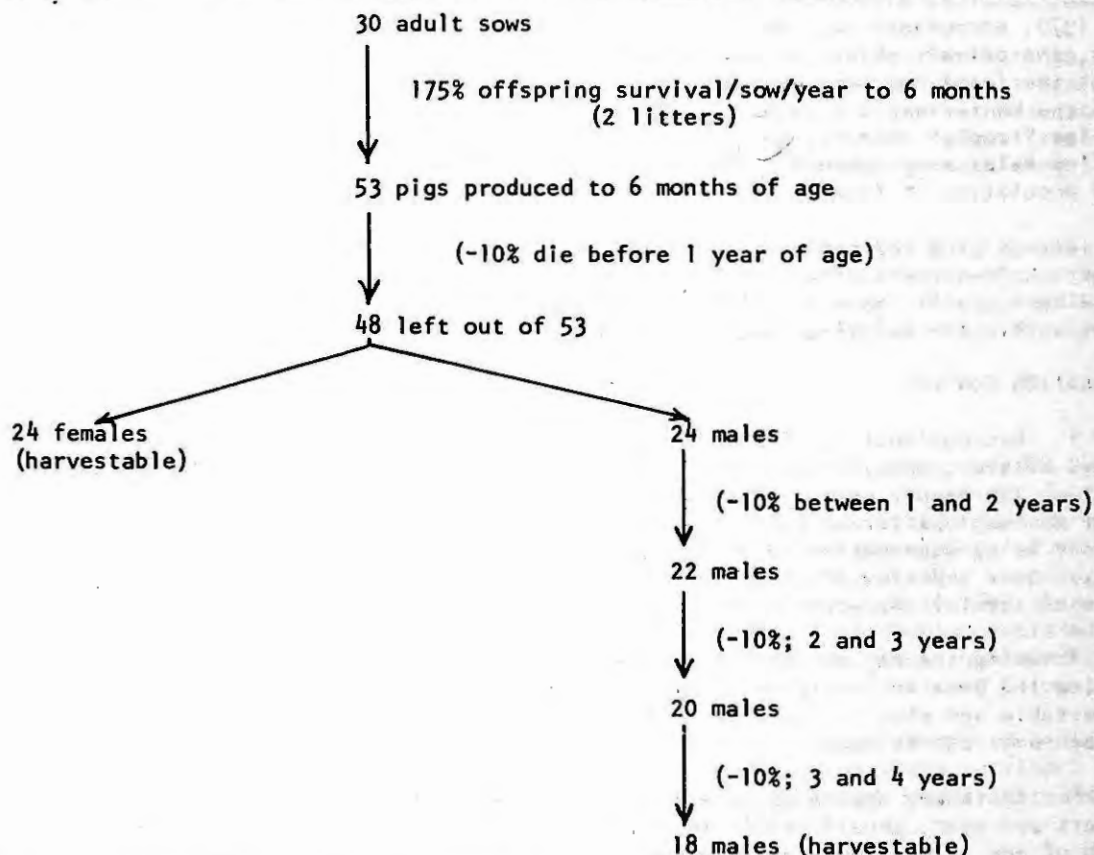


Figure 2. Population structure--indicating pig numbers and harvestable age classes correlated with time.

The numbers used here are averages from Barrett's study and occur in average acorn production years. A greater sow harvest would take place in good acorn production years and less in poor production years.

3. Acorn crops would be observed closely and generally classified. If both major species of oak on the Preserve (blue oak *Quercus douglasii* and live oak *Quercus wislizenii*) had good crops, then generally reproduction and survival of the young would be higher than average. If one species had a crop, average reproduction and survival could be expected. A poor acorn crop, neither species producing, would result in poor reproduction and poor piglet survival to the age of 6 months.

BOAR KILL RECORD	
KILL NO. <u>37</u>	DATE <u>12/19/73</u> CUTIE <u>JD</u>
HUNTER <u>Bob Near</u>	(BOAR) BARROW SOW
LOCATION <u>1/4 mile due east of</u> <u>Holding Field on Holding Field Road</u>	
DRESSED WEIGHT <u>173</u>	CONDITION E G (F) P AGE <u>4+</u>
TUSK LENGTH <u>2 1/2" & 2 3/4"</u>	COLOR <u>Blk</u>
REMARKS: (hybrids, flo. embryos, etc.) <u>red</u> <u>Taq 23? - Taq Broken -</u> <u>^ Roto</u>	

Figure 3. Example of a completed Boar Kill Record card.

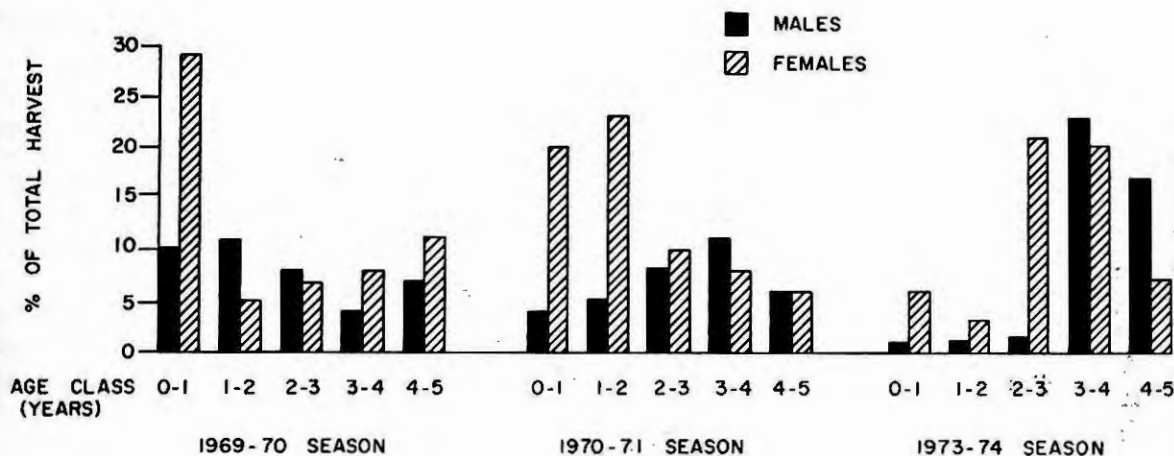


Figure 4. The percentage of boars and sows harvested on guided hunts for the various annual seasons.

4. During good acorn years, hunters would be allowed to take two or more sows less than 100 lbs. in some areas. Also, fewer adult sows would be left in that area because of the greater reproduction and survival per litter. This would reduce the number of upcoming and remaining adults, therefore preventing an over population the following year. Should the population structure shift so that there are more boars than sows, then the above practice could be done with boars also. To conclude, the number of animals harvested would depend on the reproduction and survival of the young any one year.

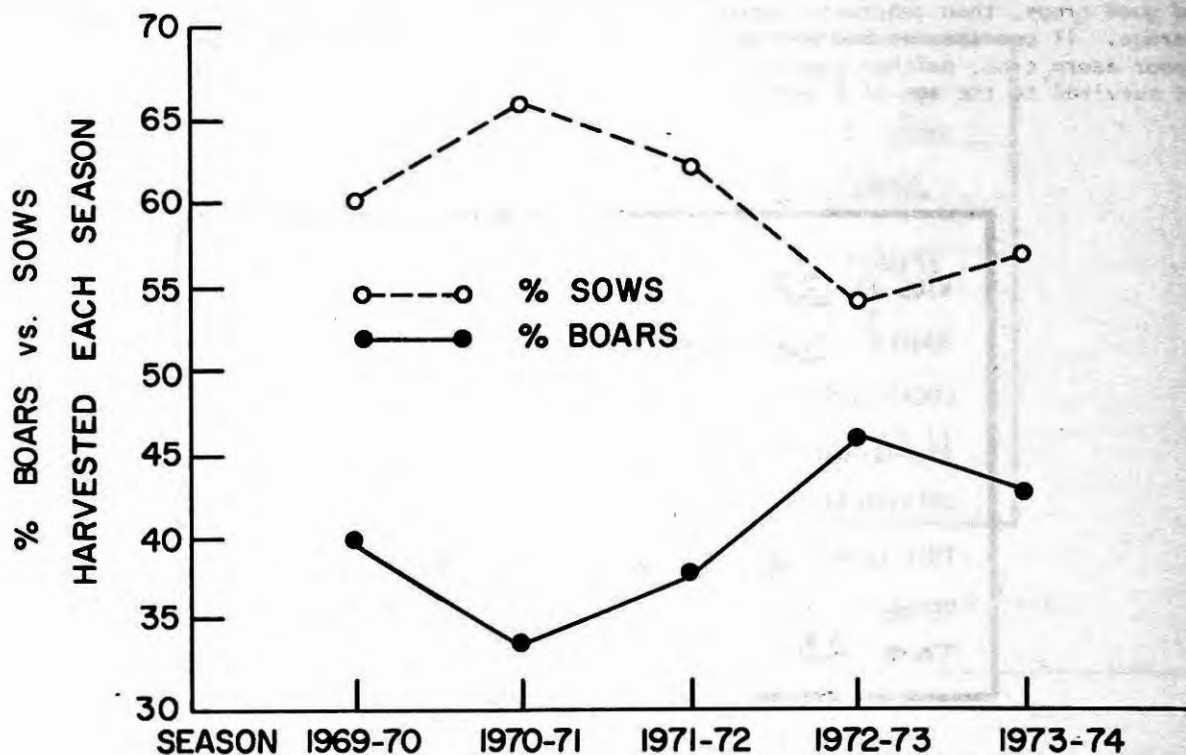


Figure 5. The percentage of boars versus sows taken during each of five hunting seasons.

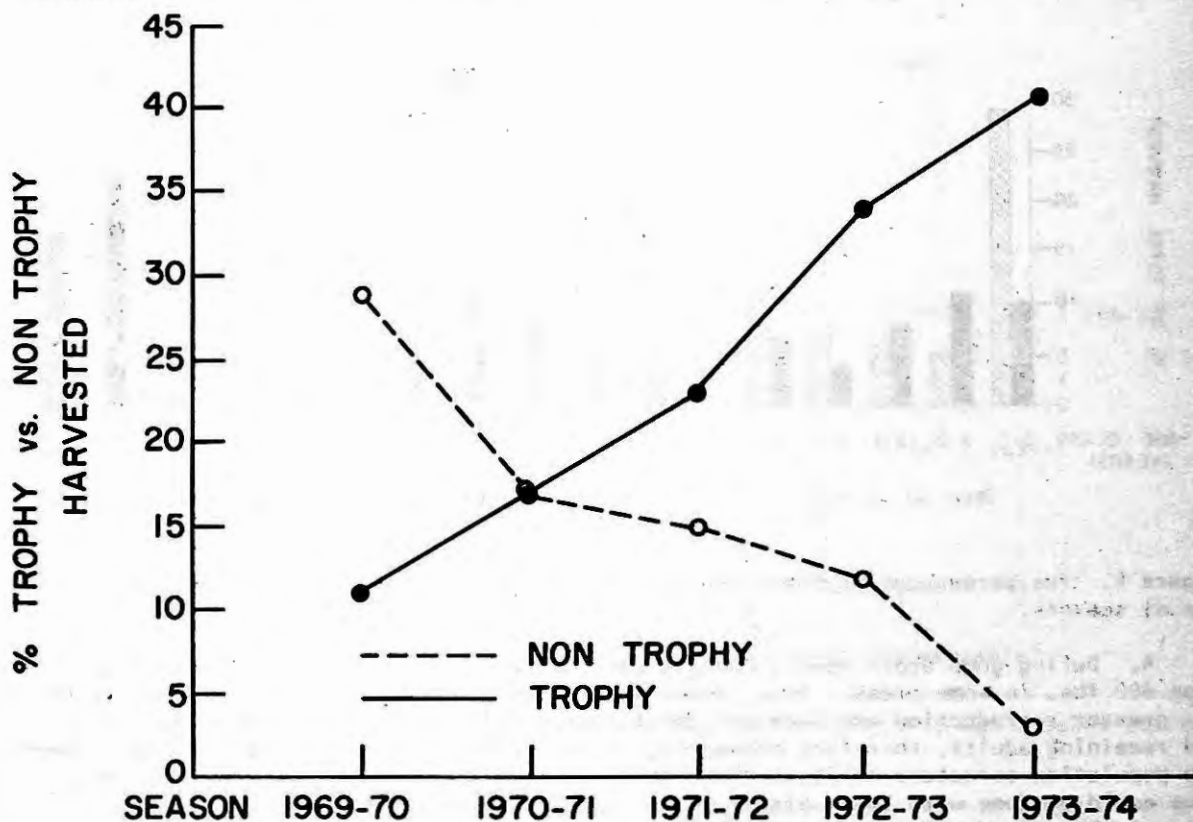


Figure 6. A comparison of the percentages of trophy versus non-trophy boar harvested for each of five hunting seasons.

HERD QUALITY

1. All hunts would be guided so as to guarantee the proper animal would be taken.
2. A maximum of three hunters per guide would enable guides to control the hunters.
3. Dogs would not be used. This practice would reduce the mortality rate in young pigs which is high when dogs bay a sow with a litter, as well as minimize the amount of disturbance among the several thousand cows that are using the area during the Preserve's hunting season. Finally, selection for the proper animal is very difficult when using dogs.
4. Hunters were encouraged to take only those boars with tusks greater than 2 inches. This is generally an animal 3 years or older. He is strictly one with large tusks (the desired trophy) and is very poor quality as far as the meat is concerned. If this animal could not be found in the allotted two day hunt, (which could be extended if the hunter wished) then the hunter was strongly advised to take a sow, which is very palatable. In this way, the hunter would be taking something home he could use. Therefore, hunters were conditioned before the hunt with the idea that a young boar was neither good eating or a trophy while the older boars were good trophies only and a nice sow was excellent eating.
5. Any sow was considered a harvestable animal if she was in good condition and without young.
6. a. Color selection - Persons wishing to take a sow were directed by the guide to take those other than black. In this way, the desired black color in trophy animals would be selected.
b. Boars other than black would be castrated if trapped thus selecting black color in the breeding stock.

MISCELLANEOUS CONTROLS

Electric Fence

Four and one half miles of electric fence has been constructed along the western boundary of the Preserve. The fence operates out of a 110 volt outlet through a 2-4-D Unicom controller. The wire is attached to the inner face of the fence post approximately 8 inches off the ground. It is operating from May through September; when the greatest migration into the pasture systems occur.

RESULTS

Electric Fence

Where the electric fence exists, it has nearly halted the migration into pasture areas. Before the fence was installed one neighbor trapped over 75 animals one summer, nearly exterminating an entire population in one area. Today, 4 years later, this area has as many animals as it did then. Damage to his pasture is virtually nonexistent and he traps only 3 or 4 animals yearly.

Population Control

Recreational hunting has been very instrumental in controlling the population. Over 700 individual animals have been trapped and ear tagged by Barrett and Preserve personnel. Today, data collected from field observations and ear tag returns indicates we now have a population of approximately 900 animals. This is 13 animals per square mile and is within the suggested carrying capacity of the range. We must be careful though; poor acorn crops in 1971 and 1972 did take toll on the herd. The exact influence of each of these factors is not clearly understood.

Herd Quality

Records have been kept on all animals harvested during the past 5 seasons. From these records we can gain the necessary information so that we may judge the progress of the program (Figure 3).

The percentages of boars and sows harvested on guided hunts during three of five seasons are shown in Figure 4. During the 1969-70 season, 11% of the animals harvested were trophy size boars while 19% consisted of younger boars. This was the last season there was no real effort to keep hunters from taking young boars. Beginning the 1970-71 season, for the first time, guides were to emphasize to the hunter that young boars would not be taken, even though 17% of the total harvest was young boars. Most of these were taken by hunters on their own while the guide was not in immediate contact with them. Some can be classified

as "mistake animals" due to the guides failure, at times, to distinguish between a trophy boar versus a young one. Also, there were few trophies in the population and some hunters insisted on taking a male no matter what the size. As the years progressed, employing the same guides and putting new ones through a training program (where they would go on hunts as observers only) has allowed more boars to mature to trophy size, thus becoming more frequent. In this season, 1973-74, only 3% of the total harvest consists of non-trophies while 40% are trophies.

The percentage of boars versus sows taken during the 5 seasons is indicated in Figure 5. The 1969-70 season produced a total of 40% boars versus 60% sows. 1970-71 produced 34% boars versus 66% sows. The difference here is a result of the guide's ability to convince hunters to take sows if trophy boars could not be found. As the number of trophy boars increased, so did the percentage of males harvested. This season, 40% have been trophy and 57% sows with 3% non-trophy (accidents). This percentage represents nearly 100% success for hunters wishing for a trophy and 100% for those wanting an animal that is good eating.

The percentage of trophy versus non-trophy boars harvested out of the total number each of the 5 years is illustrated in Figure 6. Again, convincing trophy hunters to take sows when trophies could not be found has allowed the number of trophy size animals to increase to the point where virtually all such hunters now are able to take a trophy animal.

When comparing black animals versus other colored animals harvested in 1969-70 and 1973-74, we found that this program has not changed the herd significantly. Thirty-eight percent of the animals taken the first year were black versus 37% in 1973-74. In the future, this particular consideration, when examining herd quality, will be less important because most sportsmen are beginning to recognize feral hog as a game animal in their own right.

CONCLUSION

Recreational hunting has been an especially effective tool in controlling the quality and population of the Dye Creek Preserve's feral hog herd. Such a program can allow them a niche on private range lands as well as provide added income for the landowner and recreation for the public.

LITERATURE CITED

- BARRETT, R. H. 1971. Ecology of the feral hog in Tehama County, California. 105-122, 186-224, 234-265, 309.